

EMP Review, Appendix I B



Special Studies

Contents:

I. IEP EMP SPECIAL STUDY CATEGORIES	1
II. PROCEDURES FOR APPROVAL OF IEP EMP SPECIAL STUDIES	1
III. HOW TO WRITE A PROPOSAL FOR AN IEP EMP SPECIAL STUDY	2
A. Introduction	2
B. Standard format for IEP EMP special study proposals	3
IV. EXAMPLE: A RECENTLY APPROVED PROPOSAL FOR AN IEP EMP SPECIAL STUDY	5
V. EXCERPT FROM THE 2002 IEP PLANNING DIRECTIVITIES: INFORMATION NEEDED IN PROPOSALS	10

I. IEP EMP Special Study Categories

1. Evaluations of methods and instrumentation
2. Special (additional) monitoring
3. Special data analyses requiring additional resources
4. Investigations of ecological processes necessary to understand water quality monitoring data (Note: special studies in this category should also be proposed to and funded by the IEP EET, CALFED, etc.)

II. Procedures for approval of IEP EMP Special Studies

Ideas for IEP EMP special studies are brought to the attention of the IEP Water Quality PWT. Written proposals to the IEP WQ PWT are required for approval and/or funding of special studies by the IEP WQ PWT. Proposals are reviewed by the IEP Water Quality PWT members, discussed, and approved via majority vote. For some studies, outside funding (e.g. CALFED) may be necessary.

III. How to write a proposal for an IEP EMP special study

A. Introduction

The following excerpt from a “Proposal Writer’s Guide” developed at the University of Michigan gives some perspective on proposal writing. This guide was written for people with little or no experience in writing proposals for sponsored activities.

The full document is available at
http://www.research.umich.edu/research/proposals/proposal_dev/pwg/pwgcomplete.html

“Writing a proposal for a sponsored activity such as a research project or a curriculum development program is a problem of persuasion. It is well to assume that your reader is a busy, impatient, skeptical person who has no reason to give your proposal special consideration and who is faced with many more requests than he can grant, or even read thoroughly. Such a reader wants to find out quickly and easily the answers to these questions.

- What do you want to do, how much will it cost, and how much time will it take? How does the proposed project relate to the sponsor's interests?*
- What difference will the project make to: your university, your students, your discipline, the state, the nation, the world, or whatever the appropriate categories are?*
- What has already been done in the area of your project?*
- How do you plan to do it?*
- How will the results be evaluated?*
- Why should you, rather than someone else, do this project?*

These questions will be answered in different ways and receive different emphases depending on the nature of the proposed project and on the agency to which the proposal is being submitted. Most agencies provide detailed instructions or guidelines concerning the preparation of proposals (and, in some cases, forms on which proposals are to be typed); obviously, such guidelines should be studied carefully before you begin writing the draft.”

So: Please follow the standard format and guidelines for IEP EMP proposals outlined in the next section!

B. Standard format for IEP EMP special study proposals

The standard format and guidelines below address all information needs identified for IEP research proposals in the 2002 IEP Planning Directivities, s. V. Written proposals should follow this format. All proposal elements listed below should be addressed, although the order of the proposal elements may be changed.

- 1. Proposed Program Element Title and Date**
- 2. Proposal author(s) and/or Principal Investigator(s)** (Include phone numbers and email addresses)
- 3. Other Participants**
- 4. Project Summary** (BRIEFLY highlight the main points of the proposal)
- 5. Table of contents** (Required only if the proposal is longer than 3 pages, without attachments)
- 6. Introduction: Problem Statement**
 - a) Purpose/objectives of the study
 - b) Hypotheses or questions, possibly with a “conceptual model”
 - c) Significance of the proposed research
- 7. Background and justification** (What is the background/history behind this study that makes it important? What is the context? What has been done so far? What do you already know about this topic? Why is this study necessary? - Cite, reference, and/or attach literature and other documents as appropriate.)
- 8. Approach**
 - a) Study Design (How will you carry out this study? Be specific! Describe as many of the following aspects as possible and appropriate: Spatial and temporal aspects (e.g. study area(s), sampling frequency/schedule, etc), experimental design, description of study components, types and amounts of samples/data collected, sampling and sample analysis methods, QA/QC, etc. – attach tables and figures as necessary)
 - b) Description of data analysis, storage, and QA/QC (Where, when, and how will data be recorded, analyzed, and stored?)

- 9. Expected products and product dissemination and evaluation** (What types of products do you expect from this study? How will they be made available, evaluated, and used by others? At a minimum, a **written final report** has to be submitted to the WQ PWT. Other possible products include IEP Newsletter articles, presentations at annual workshop or other scientific group meeting, and peer reviewed papers.)
- 10. Project organization and resources** (Who will do what, where, when, for how long, using what? How long will the whole project take? All of this may be summarized in a table. At a minimum, include a **work plan** with completion dates for the identified program components including field work, sample and data analysis, and submission of products (final report etc., see 9.))
- 11. Budget** (dollar amounts or estimates of effort, *e.g.*, number of days per person/boat/lab analysis/data analysis, etc.)
- 12. References**
- 13. Attachments**
- a) Tables and Figures (can also be embedded in the proposal)
 - b) Documents relevant to the project and not readily available elsewhere

IV. Example: A recently approved proposal for an IEP EMP Special Study

Note: This proposal was prepared without a standard format in place.

January 9, 2001

Program Element Title

Method Comparison for Chlorophyll Extraction

Principle Participants

Katherine Triboli, ktriboli@water.ca.gov, Casey Ralston, cralston@water.ca.gov,
Anke Mueller-Solger, amueller@water.ca.gov, Mark Bettencourt,
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I. Project Overview

This study will compare the two methods for the extraction of chlorophyll *a* used in the IEP Environmental Monitoring Program. The sonication method was first utilized starting in 1968 under the direction of Doug Ball, USBR. From 1972 until February, 1998 the extractions were performed by staff of the Bay-Delta Monitoring and Analysis Branch under the direction of Harlan Proctor, DWR. Since 1998, chlorophyll analyses have been carried out by DWR's Bryte Chemical Laboratory using extraction and spectrophotometric analysis procedures specified in Standard Method 10200 H (Standard Methods, 20th Edition, 1998 prepared and published jointly by American Public Health Association, American Water Works Association and Water Environment Federation, page 10 – 18).

Project Purpose and Objectives

This comparison is needed in order to determine the comparability of the chlorophyll *a* concentration estimates generated by the two different methods.

Project Organization

Kitty Triboli and Casey Ralston will be responsible for coordinating and implementing the comparison study, with scientific direction and assistance from Anke Mueller-Solger. Kitty Triboli will perform extractions and spectrophotometric analyses according to the pre 1998 procedures. Casey Ralston will be responsible for data analysis and reporting. Mark Bettencourt of Bryte Lab will perform extractions and spectrophotometric analyses according to the Standard Methods procedures.

Study Design

This study will have five components: **1)** Preparation of instruments and equipment; **2)** collection of samples; **3)** extraction and spectrophotometric determination of chlorophyll *a* in replicate samples using the two methods; **4)** data analysis; and **5)** report of results.

1.) Instruments and Equipment

The pre-1998 spectrophotometer and the strip recorder are still in storage at Bryte Lab, as is the sonicator bath used in the extraction process. (As per verbal agreement with Doug Ball). The spectrophotometer, recorder and centrifuge will be set up at the USBR lab near El Camino in Sacramento where it was previously housed. Though the counter space is sparse, measurements were taken, and it was determined that there is enough space available for the equipment.

Some supplies will have to be purchased. A centrifuge has been purchased for \$1,157.77. The 15 ml pyrex centrifuge tubes with screw caps are approximately

\$174 for a case of 12. Wire racks cost approximately \$18. Hopefully, some supplies, such as a 10 ml pipette could be loaned to us from Bryte, since we gave all of our equipment to them when we turned over the chlorophyll process. It is expected that Rick Novatney, a Customer Engineer for Perkin-Elmer, will perform a calibration and verification of the Lambda 3B spectrophotometer. The estimated cost of this service: \$225.00 per hour at 6.5 hours = \$1,462.50. A DSA with three bids has been suggested for the cost of this service.

2.) Sample Collection

Suggested sampling frequency and sites: In order to test method compatibility at both low and high concentrations of chlorophyll, and for different algal community compositions, the study will encompass one full year with samples taken at different locations throughout the year. Three replicate samples will be taken at each site, for each method, for a total of six samples per site. Sites will be chosen to capture the natural variability in Delta chlorophyll concentrations, algal community composition, and salinity levels. These samples will be taken each month from four sites: C10, S42 and D41, plus one randomly chosen site every month from the Mid Delta and or North Delta (Table 1).

Sample volumes for this study will be 400 ml in keeping with pre 1998 sample volumes.

3.) Extraction

Bryte Lab will use APHA Standard Method 10200 H for the extraction and analysis of chlorophyll *a*. This method includes grinding of filters to disrupt cells. Bryte Lab will be using a Perkin-Elmer Lambda 40, with computer-controlled plots and interpretation.

Bay-Delta samples will be extracted with the USBR Modified Method that uses sonication and heat for disruption of cells. The Perkin-Elmer Lambda 3B

spectrophotometer that was previously in use will be reinstated and used for this program.

Pre 1998 Extraction Procedure

Reagents: 90% acetone, 1N HCL

1. Filter 400mls of sample using two glass fiber filters prepared by pre-wetting with a saturated solution of Mg CO.
2. Store folded filters frozen in darkness up to 3 weeks in small manila envelopes.
3. Always keep the samples (usually 2 filters) in subdued light. On day of extraction, place samples in centrifuge tubes with 10 mls of 90% acetone. Place in a water bath sonication unit at a temperature of 53 C°, with 15 minutes of heat only, followed by 15 minutes of sonication.
4. Samples are then cooled to room temperature in a water bath. After the samples have steeped for a total of two hours, including sonication time, the filters are then removed from centrifuge tubes, extracting as much acetone as possible.
5. Add one μ drop of saturated saline solution to each sample and shake.
6. Centrifuge for 10 minutes at 1000 Xg., or at the setting of 90, on the centrifuge. Decant into fresh centrifuge tubes and spin for another 5 minutes. Samples are now ready for analysis on the Perkin-Elmer Spectrophotometer. The spectrophotometer is to be set with a band width of 1, on visible light, mode is absorbance, scan speed 120 nm/min. Wave lengths set between -010 and 1.0, with scans read at the 750, 663 and 665.

4.) Data Analysis

Methods will be compared using analysis of variance. If significant differences are detected, further analyses using other available water quality data will be used to determine patterns and underlying causes.

5.) Products

The product from this study will be a written summary of the findings and possibly recommendation for utilization of the historic chlorophyll data. The report will be completed within one year after the last sample is analyzed and then will be linked to the water quality meta data available on the web.

Data Storage and QA/QC

The Bryte Lab data will be entered into a Microsoft Access database via FLIMS. The Bay-Delta Section data from will be entered into the Microsoft Excel spreadsheets for calculation, then transferred into Microsoft Access database, with data from each method to be shown side by side. Data QA/QC is assured on the Bryte Lab side, through the standard QA/QC procedures. Data QA/QC on the Bay-Delta side will include internal review and checking of each data set against original data sheets.

V. Excerpt from the 2002 IEP Planning Directivities: Information needed in proposals

Proposed Program Element Title

Principal Investigator(s)

Include phone number and email address for each principal investigator

What question(s) will the proposed work answer or what hypotheses will the work test?

How will your proposal answer the question(s) or test the hypotheses?

What data will be collected and/or analyzed?

What parameters will be measured?

Where will samples be collected?

Describe the study area

At what frequency will samples be collected?

What methods and gear will be used?

What analyses will be done with the data?

What resources will be needed to complete this proposal?

Include budget that contains totals for

Permanent personnel

Temporary personnel

Staff benefits (if applicable)

Operation costs

Equipment costs

Any indirect costs (also called overhead by some agencies)

Total Budget for proposal

What are the personnel needs for the proposal?

Permanent (number of people per class or category)

Temporary

What equipment will be needed?

Boats

Other equipment

How long will the work take?

When does the work need to start?

When will the work be finished?

Field work
Analysis
Submission of final report

What products or deliverables will the proposed work produce and when?

Peer reviewed papers

IEP Newsletter articles

Presentations at annual workshop or other scientific group meeting

What data will be collected and stored by the work?

Where will the data be stored?

When will it be uploaded to the IEP server?

Will the work result in the "take" or have the probability "taking" any state or federally listed threatened or endangered species?

If so, please estimate the number per species/race/life stage.

If the program element will result in the "take" or capture of any state or federally listed species, will this "take" be covered by IEP Biological Opinions or some other Biological Opinion?